WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE

3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

B9902020

December 9, 1969

MR. GEORGE HOUGHTAILING
Community Planning, Inc.
Suite 602, 810 Richards Street
Honolulu, Hawaii 96813

Dear Mr. Houghtailing:

Subject: Ahuimanu Catholic Church Site
Preliminary Soil Report
(for mass grading purposes)
Ahuimanu, Koolaupoko, Oahu, Hawaii
Tax Map Key: 4-7-04
Chapter 23, Revised Ordinances of
Honolulu, 1961 As Amended

Eight borings were made at the site of the proposed Ahuimanu Catholic Church site at Ahuimanu Valley, Oahu, Hawaii.

The borings were generally made within the "Approximate limits of grading" shown on the Proposed Grading Plan, dated August 18, 1969.

PRELIMINARY FIELD EXPLORATION AND LABORATORY TESTS

The borings were made with 3-in. diameter augers. Soil samples were recovered with 2 and 3-in. thin wall tubes and 2-in. standard split spoon samplers driven with a 140-lb hammer falling 30 inches.

Laboratory tests included: natural water content determinations, Atterberg limits, sieve analysis, consolidation, expansion and CBR.

GENERAL SITE AND SOIL CONDITIONS

The site is divided down the middle by a drainageway that flows in the northerly direction. The soil conditions at the site may be generally separated into 2 categories, the lower and upper areas. The lower area generally consists of materials washed down from the upper areas and forms the bed of the drainageway. The upper areas consist of residual soils that form the eastern and western slopes along the drainageway.

Lower Area

The soils encountered in Boring Nos. 3 and 5 may be generally described as follows:

A surface layer of soft, brown and gray silty clay to about 13 to 19 ft, underlain by medium to stiff brown clayey silt to about 26 to 32-ft depths.

Decomposed rock was encountered in Boring No. 3 from 26 to 28 ft. A pocket of peaty material was noted in Boring No. 5 between 4 to 6-ft depths.

Water was noted near the surface at Boring No. 3 and at about 3-ft depth in Boring No. 5.

Upper Areas

The soils encountered in Boring Nos. 1, 2, 4, 6, 7 and 8 may be generally described as follows:

Medium to stiff, brown clayey silt with decomposed rock to about 23 to 41 ft, the depths drilled. Boulders or decomposed rock were encountered in Boring Nos. 2 and 8 at about 25-ft depth.

Water was noted in Boring No. 8 at about 1.5-ft depth at the time of the field exploration.

For more detailed descriptions of soils encountered in the borings, refer to the boring logs.

GENERAL DISCUSSION AND RECOMMENDATIONS

The present plan is to cut the western slope for material to fill the lower area. Fills up to about 25 ft in height may be placed in the lower area.

Before any fill construction is started in the lower area, trenches should be cut and subdrains installed along the bottom of the natural drainageway to drain the site.

Localized peaty material should be removed when encountered during clearing and grubbing.

Fills should be placed slowly in thin uniform lifts to minimize the build-up of pore pressures and possible failures that may be caused by heavy load concentrations of uncontrolled stockpiles of material.

Settlement observations should be made to monitor the performance of the fills. Settlements up to about a foot or more may occur in the lower area from the 25 or more feet of fill. After the fill is in place in the lower area, surface construction should be delayed as long as practicable to allow the subsoils to consolidate. Surface structures may start when settlement gages show negligible rates of settlement.

All grading should be done in accordance with the requirements of Chapter 23, Revised Ordinances of Honolulu, 1961 As Amended and the recommendations contained herein.

Subdrains

Subdrains should be placed in a herringbone pattern along the bottom and sides of the natural drainageway in the lower area. Trenches for subdrains should extend to the bottom of the muck soil and backfilled with granular filter material. The final locations of the subdrains should be determined in the field after clearing and grubbing.

There is an existing subdrain in the southern end of the lower area. This line should be located during construction and connected up to the subdrainage system that will be placed downstream of the existing line.

Proposed subdrainage details are shown on Figure 2.

Fills

In general, the on-site soils from the upper areas may be used for fill construction. It is slightly on the wet side for compaction purposes but may be used after drying.

The following may be used as a guide for fill construction:

1. Before placing any fill, all vegetation, decomposed organic matter, rubbish and other unsuitable material should be removed.

   Soft pockets should be excavated and replaced with select material.

It may be necessary to place a layer of fill over the lower area after clearing and grubbing to form a working platform. This fill should be placed and rolled in as thin lifts as practicable. At the north end of the drainageway, the working platform should be constructed of granular material where a fill slope will be constructed.

2. All loose surface soils along the existing slopes should be stripped and all new fills keyed into medium to stiff natural ground.

3. All fills should be constructed in approximately level layers starting at the lower end and working upward.

4. All fills above the working table and in the upper areas should be laid in 6-in. compacted layers with a relative density of at least 90% of AASHO T-180-57 density.

5. Settlement observations should be made periodically during and following the construction of fills in the lower area.

Slopes

Cut and fill slopes of 2 horizontal to 1 vertical or flatter are recommended.

Slope heights should be kept less than 10 ft in fill areas over the old natural drainageway.

Where slope heights greater than 20 ft are considered, 8-ft wide benches should be placed at height intervals of about 15 to 20 ft in both cuts and fills. The fills should be constructed on stiff underlying soils that are away from the lower natural drainageway.

Slope adjustments or other precautions amy be necessary if seepage zones or soft spots are encountered in localized areas.

For protection against erosion during construction, runoff water from rainstorms should be controlled by berms or other approved methods.

Slope planting is recommended on cut and fill slopes to minimize erosion.

Underground Utilities

Underground utilities should be placed after the fills are constructed and before the start of building construction.

Flexible connections are recommended where lines pass from compressible to rigid ground and for lines near structures.

Roadway

In general, a rough estimate of the roadway pavement thickness for the light residential traffic anticipated is as follows:

1. Wearing course - 2-in. asphaltic concrete.
2. Base course - 6-in. base course.
3. Subbase - 12-in. subbase course over a prepared subgrade.

Local adjustments regarding subbase requirements can be made in the field in accordance with the design standards of the City and County of Honolulu as the various soil conditions are encountered at subgrade level. In fill areas, the use of select soils within the top 2 ft of the subgrade may be considered to eliminate or reduce the thickness of the subbase course.

The subgrade should be compacted and shaped to drain. To avoid the ponding of water and softening of the subgrade at low points, weep holes should be placed at subgrade levels thru the walls of the catch basin which are placed in these low areas.

Unforeseen or undetected conditions such as soft spots or seepage water may occur in localized areas and will have to be adjusted and corrected in the field as they are detected.

This report was made primarily for mass grading purposes. Additional soil explorations should be made for building foundation purposes as the building development progresses.

Attached are the boring logs, laboratory test results and Boring Location Plan.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

Ezra Koike

Ezra Koike
Professional Engineer
Hawaii No. 1450

EK:vi

BORING LOGS

Symbols

Symbols used generally are in accordance with the Unified Soil Classification System.

Where a parenthesis "(MH)" is used, the soil sample was classified by visual observation of the sample recovered.

Where no parenthesis "MH" is used, the soil sample was classified from either the Atterberg limits or sieve analysis test results.

WALTER LUM ASSOCIATES

3030 WAIALAE AVENUE • HONOLULU, HAWAII 96816 • PHONE 737-7931

Boring Log

PROJECT: CATHOLIC CHURCH SITE - AHUIMANU
LOCATION: VALLEY OF THE TEMPLES
AHUIMANU, OAHU, HAWAII
TMK: 4-7-04

HAMMER:
Weight 140 #
Drop 30 "
SAMPLER: 2"S - 2" THIN WALL TUBE
2"SS - 2" STANDARD SPLIT SPOON

BORING NO. 1 Sheet No. _____ of _____
Driller WALTER LUM ASSOC. Date SEPT. 29, 1969
Field Party MAU, HASHIDA, MAKAULA
Type of Boring AUGER (MOBILE MINUTEMAN) Diam. 3"
Elev. 165'± * Datum _____
Drill Bit T.C. DRAG

Water Level	NOT NOTED			
Time				
Date	9-29-69			

Unified Soil Classification	DESCRIPTION	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Moist. Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Lab. Torvane Shear P.S.F.	PENETRATION DATA: STANDARD PENETRATION TEST Blows Per Foot 0 10 20 30 40	PENETRATION DATA: 2" THIN WALL TUBE SAMPLER BLOWS/0.5'
	ELEV. = 165'± *	0									
			2"S	1-A	-	47	-	5310	-		5/5' 7/5'
(MH)	STIFF, BROWN, CLAYEY SILT W/ TRACES OF DECOMPOSED ROCK	5	2"S	1-B	-	52	-	4580	-		3/5' 4/5'
		10	2"SS	1-C	-	66	-	-	-		
(MH)	MEDIUM TO STIFF, BROWN SILTY CLAY W/ TRACES OF DECOMPOSED ROCK	15	2"S	1-D	-	64	-	4580	-		2/5' 5/5'
		20	2"SS	1-E	49	68	154	-	-		
(CH)	STIFF, MOTTLED BROWN CLAY	25	2"S	1-F	-	69	-	2080	-		2/5' 4/5'
(CH)	MEDIUM, MOTTLED GRAY CLAY W/ TRACES OF DECOMPOSED ROCK	30	2"SS	1-G	52	79	148	-	-		
	END OF BORING @ 31.5'										
	*ELEVATION ESTIMATED FROM GRADING PLAN.										

M's
7/69

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Boring Log

PROJECT: CATHOLIC CHURCH SITE - AHUIMANU

LOCATION: VALLEY OF THE TEMPLES
AHUIMANU, OAHU, HAWAII
TMK: 4-7-04

HAMMER:
Weight: 140#
Drop: 30"

SAMPLER: 2" S - 2" THIN WALL TUBE
2" SS - 2" STANDARD SPLIT SPOON

BORING NO. 2 Sheet No. _____ of _____

Driller: WALTER LUM ASSOC. Date: OCT. 1, 1969

Field Party: MAKAULA, HASHIDA

Type of Boring: AUGER (MOBILE MINUTEMAN) Diam.: 3"

Elev.: 150'± * Datum: _____

Drill Bit: T.C. DRAG

Water Level: NOT NOTED

Time: _____

Date: 10-1-69

Unified Soil Classification	DESCRIPTION	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Moist. Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Lab. Torvane Shear P.S.F.	PENETRATION DATA: STANDARD PENETRATION TEST Blows Per Foot (0 10 20 30 40)	PENETRATION DATA: 2" THIN WALL TUBE SAMPLER BLOWS/0.5'
	ELEV. = 150'± *	0									
(MH)	MEDIUM, MOTTLED BROWN CLAYEY SILT w/ DECOMPOSED ROCK			2-A	-	51	-	-	-		2/.5' 3/.5'
		5		2-B	-	64	-	-	-		1/.5' 2/.5'
		10		2-C	-	66	-	-	-		
		15		2-D	-	68	-	-	-		1/.5' 2/.5'
		20		2-E	-	73	-	-	-		
		25		2-F		(NO RECOVERY)					15/.0'
	END OF BORING @ 25'										

*ELEVATION ESTIMATED FROM GRADING PLAN

M's
7/69

WALTER LUM ASSOCIATES

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Boring Log

PROJECT: CATHOLIC CHURCH SITE-AHUIMANU
LOCATION: VALLEY OF THE TEMPLES
AHUIMANU, OAHU, HAWAII
TMK: 4-7-04

HAMMER:
Weight: 140#
Drop: 30"

SAMPLER:
2" S - 2" THIN WALL TUBE
2" SS - 2" STANDARD SPLIT SPOON
3" S - 3" THIN WALL TUBE

BORING NO. 3 Sheet No. ____ of ____
Driller WALTER LUM ASSOC. Date SEPT. 11, 1969
Field Party MAU, HASHIDA, MAKAULA
Type of Boring AUGER (MOBILE MINUTEMAN) Diam. 3"
Elev. 110'± * Datum ____
Drill Bit T.C. DRAG

Water Level	1.0'	0'			
Time	3:10 PM	-			
Date	9-11-69	9-23-69			

Unified Soil Classification	DESCRIPTION (ELEV. = 110'± *)	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Moist. Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Lab. Torvane Shear P.S.F.	PENETRATION DATA: STANDARD PENETRATION TEST Blows Per Foot (0 10 20 30 40)	PENETRATION DATA: 2" & 3" THIN WALL TUBE SAMPLER BLOWS/0.5' (WT. OF HAMMER 1.0')
(MH)	SOFT, REDDISH BROWN, CLAYEY SILT W/ DECOMPOSED ROCK	0	2"S	3-A		44					
					(	NO	RECOVERY)				PUSH/2.0'
		5	3"S								
(MH)	SOFT, GRAY BROWN SILTY CLAY W/SOME DECOMPOSED ROCK		3"S		(	NO	RECOVERY)				1/1.0' 1/.5' 1/.5'
			3"S			78		530			2/.5' 1/.5' 2/.5' 2/.5'
						84		720			
		10	2"S	3-C	-	68	-	1650	-		1/.5' 1/.5'
		15	2"SS	3-D	-	47	-	-	-		
(MH)	STIFF, GRAY-BROWN CLAYEY SILT W/ DECOMPOSED ROCK										
		20	2"SS	3-E	-	76	-	-	-		
		25									
	DECOMP. ORGANIC MATTER		2"SS	3-F	-	173	-	-	-		
(MH)	GRAY, CLAYEY SILT					79					
	END OF BORING @ 28.5'			3-G	-	-	-	-	-		15/.0'

*ELEVATION ESTIMATED FROM GRADING PLAN.

M's 7/69

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Boring Log

PROJECT: CATHOLIC CHURCH SITE - AHUIMANU
LOCATION: VALLEY OF THE TEMPLES
AHUIMANU, OAHU, HAWAII
TMK 4-7-04
HAMMER:
Weight
Drop
SAMPLER: 3" O.D. PISTON TUBE SAMPLER

BORING NO. 3A Sheet No. ____ of ____
Driller WALTER LUM ASSOC., INC. Date SEPT. 12, 1966
Field Party MAKAULA, HASHIDA, MAU
Type of Boring HAND AUGER Diam. 4"
Elev. 110'± * Datum
Drill Bit

Water Level	0.75'			
Time	9:15 A.M.			
Date	9-12-66			

Unified Soil Classification	DESCRIPTION	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Moist. Cont. %	Liquid Limit	Unconf. Comp. P.S.F. / Lab. Torvane Shear P.S.F.	PENETRATION DATA: Blows Per Foot 0 10 20 30 40 / 3" O.D. THIN WALL TUBE
	ELEV. = 110'± *								
	9-12-66 ▽								
	SOFT, BROWN & GRAY SILTY CLAY	0							
		5		3A-A	53	99 108 104	131	- / 440	PUSH/2.0'
				3A-B	51	72	100	- / 180	PUSH/2.0'

* ELEVATION ESTIMATED FROM GRADING PLAN

M's 7/69

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Boring Log

PROJECT: CATHOLIC CHURCH SITE-AHUIMANU
LOCATION: VALLEY OF THE TEMPLES
AHUIMANU, OAHU, HAWAII
TMK: 4-7-04

HAMMER: Weight 140 #, Drop 30"
SAMPLER: 2" S - 2" THIN WALL TUBE; 2" SS - 2" STANDARD SPLIT SPOON

BORING NO. 4 Sheet No. ____ of ____
Driller WALTER LUM ASSOC. Date SEPT. 30, 1969
Field Party MAKAULA, HASHIDA, LUNING
Type of Boring AUGER (MOBILE MINUTEMAN) Diam. 3"
Elev. 180'± * Datum ____
Drill Bit T.C. DRAG

Water Level				
Time				
Date	9-30-69			

Unified Soil Classification	DESCRIPTION	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Water Cont. %	Liquid Limit	Unconf. Comp.	Vane Shear P.S.F.	PENETRATION DATA: STANDARD PENETRATION TEST Blows Per Foot (0 10 20 30 40)	PENETRATION DATA: 2" THIN WALL TUBE SAMPLER BLOWS/0.5'
	ELEV. = 180'± *	0		4-A	-	61	-	2810	-		2/5' 2/5'
MH	MEDIUM TO STIFF, BROWN CLAYEY SILT w/ SOME DECOMPOSED ROCK	5		4-B	50	62	104	4430	-	-	4/5' 5/5'
		10		4-C	-	63	-	-	-		
		15		4-D	-	72	-	1250	-		1/8' 2/7'
(MH)	SOFT, BROWN-GRAY, CLAYEY SILT	20		4-E	-	81	-	-	-		
		25		4-F	-	71	-	3540	-		2/5' 2/5'
		30		4-G		72					
(CH)	STIFF, TAN-GRAY CLAY	35		4-H	-	61	-	5470	-		3/5' 4/5'
		40		4-I		60					
	END OF BORING @ 41.5'										

*ELEVATION ESTIMATED FROM GRADING PLAN.

WALTER LUM ASSOCIATES

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Boring Log

PROJECT: CATHOLIC CHURCH SITE - AHUIMANU
LOCATION: VALLEY OF THE TEMPLES
AHUMANU, OAHU, HAWAII
TMK: 4-7-04

HAMMER: Weight 140 #, Drop 30"

SAMPLER: 2"S - 2" THIN WALL TUBE; 3"S - 3" THIN WALL TUBE; 2"SS - 2" STANDARD SPLIT SPOON

BORING NO. 5 Sheet No. _____ of _____
Driller WALTER LUM ASSOC. Date SEPT. 12, 1969
Field Party MAU, HASHIDA, MAKAULA
Type of Boring AUGER (MOBILE MINUTEMAN) Diam. 3"
Elev. 119' ± * Datum _____
Drill Bit T.C. DRAG

Water Level 3.3'
Time 3:00 PM
Date 9-12-69

Unified Soil Classification	DESCRIPTION (ELEV. = 119' ± *)	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Moist. Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Lab. Torvane Shear P.S.F.	PENETRATION DATA: STANDARD PENETRATION TEST, Blows Per Foot (0 10 20 30 40)	2" & 3" THIN WALL TUBE SAMPLER, BLOWS/0.5'
(MH)	SOFT, BROWN, CLAYEY SILT	0	2"S	5-A	-	53	-	990	400		1/.5' 1/.5'
	9-12-69 ▽		2"S	5-B	-	74	-	-	-		WT. OF HAMMER 1.0'
(CH-OH)	VERY SOFT, GRAY PEAT W/ CLAY	5	3"S	5-C		361 238			500 400		PUSH/2.0'
			3"S	5-D		143 131			240 260		PUSH/1.5'
(CH-MH)	SOFT, GRAY SILTY CLAY	10	2"S	5-E	-	97	-	-	-		WT. OF HAMMER 1.0'
(MH)	SOFT, MOTTLED GRAY SILTY CLAY (DECOMPOSED ROCK)	15	2"S	5-F	-	78	-	570	410		1/1.5'
		20	2"SS	5-G	-	49	-	-	-		
(MH)	STIFF, BROWN CLAYEY SILT (DECOMPOSED ROCK)	25	2"SS	5-H	-	59	-	-	-		
		30	2"SS	5-I	-	63	-	-	-		
	END OF BORING @ 31.5										

*ELEVATION ESTIMATED FROM GRADING PLAN

WALTER LUM ASSOCIATES

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Boring Log

PROJECT: CATHOLIC CHURCH SITE-AHUIMANU
LOCATION: VALLEY OF THE TEMPLES
AHUIMANU, OAHU, HAWAII
TMK: 4-7-04

HAMMER: Weight 140# Drop 30"
SAMPLER: 2"S - 2" O.D. THIN WALL TUBE
2"SS - 2" STANDARD SPLIT SPOON

BORING NO. 6 Sheet No. ____ of ____
Driller WALTER LUM ASSOC. Date SEPT. 15, 1969
Field Party MAKAULA, MAU, HASHIDA
Type of Boring AUGER (MOBILE MINUTEMAN) Diam. 3"
Elev. 135± * Datum ____
Drill Bit T.C. DRAG

Water Level					
Time	-				
Date	9-24-69				

Unified Soil Classification	DESCRIPTION	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Moist. Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Lab. Torvane Shear P.S.F.	PENETRATION DATA: STANDARD PENETRATION TEST Blows Per Foot (0 10 20 30 40)	PENETRATION DATA: 2" THIN WALL TUBE SAMPLER BLOWS/0.5'
	ELEV. = 135'± *	0									
MH	MEDIUM TO STIFF, MOTTLED BROWN, CLAYEY SILT W/ GRAY CLAY POCKETS			6-A	-	55	-	4270	600		3/.5' 3/.5' 3/.5'
		5		6-B	49	51	104	6090	-		1/.5' 2/.5' 5/.5'
		10		6-C	52	63	82	-	-	◪	
MH	STIFF, MOTTLED GRAY BROWN, CLAYEY SILT W/ DECOMPOSED ROCK	15		6-D	55	73 75 73	86	-	-	◪	
		20		6-E	-	67	-	-	-	◪	
		25		6-F	-	69	-	-	-	◪	
	END OF BORING @ 26.5'										

*ELEVATION ESTIMATED FROM GRADING PLAN

M's
7/69

WALTER LUM ASSOCIATES

3030 WAIALAE AVENUE • HONOLULU, HAWAII 96816 • PHONE 737-7931

Boring Log

PROJECT: CATHOLIC CHURCH SITE-AHUMANU
LOCATION: VALLEY OF THE TEMPLES
AHUIMANU, OAHU, HAWAII
TMK: 4-7-04

HAMMER:
Weight 140#
Drop 30"
SAMPLER: 2"S - 2" THIN WALL TUBE
2"SS - 2" STANDARD SPLIT SPOON

BORING NO. 7 Sheet No. _____ of _____
Driller WALTER LUM ASSOC. Date SEPT. 29, 1969
Field Party MAKAULA, WOODS, LUNING
Type of Boring AUGER (MOBILE MINUTEMAN) Diam. 3"
Elev. 175'± * Datum _____
Drill Bit CLAY BIT

Water Level				
NOT NOTICED				
Time -				
Date 9-29-69				

Unified Soil Classification	DESCRIPTION	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Moist. Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Lab. Torvane Shear P.S.F.	PENETRATION DATA: STANDARD PENETRATION TEST Blows Per Foot (0 10 20 30 40)	PENETRATION DATA: 2" THIN WALL TUBE SAMPLER BLOWS/0.5'
	ELEV. = 175'± *	0									
MH	STIFF, BROWN, CLAYEY SILT w/ TRACES DECOMPOSED ROCK		2"S	7-A	-	53	-	-	-		7/5' 7/5'
		5	2"S	7-B	-	54	-	4900	-		6/5' 7/5'
		10	2"S	7-C	-	54	-	-	-		5/5' 8/5'
		15	2"S	7-D	-	59	-	2290	-		6/5' 10/5'
(MH)	STIFF, MOTTLED BROWN CLAYEY SILT w/ DECOMPOSED ROCK										
		20	2"S	7-E	-	61	-	1620	-		6/5' 8/5'
		25	2"SS	7-F	-	65	-	-	-		
		30	2"SS	7-G	-	67	-	-	-		
	END OF BORING @ 31.5'										

*ELEVATION ESTIMATED FROM GRADING PLAN

M's 7/69

WALTER LUM ASSOCIATES

3030 WAIALAE AVENUE • HONOLULU, HAWAII 96816 • PHONE 737-7931

Boring Log

PROJECT: CATHOLIC CHURCH SITE-AHUMANU
LOCATION: VALLEY OF THE TEMPLES
AHUIMANU, OAHU, HAWAII
TMK: 4-7-04

HAMMER:
Weight: 140 #
Drop: 30"

SAMPLER: 2" THIN WALL TUBE

BORING NO. 8 Sheet No. _____ of _____
Driller: WALTER LUM ASSOC. Date: SEPT. 15, 1969
Field Party: MAKAULA, HASHIDA, MAU
Type of Boring: AUGER (MOBILE MINUTEMAN) Diam.: 3"
Elev.: 132'± * Datum: _____
Drill Bit: T.C. DRAG

Water Level	1.3'				
Time	-				
Date	9-24-69				

Unified Soil Classification	DESCRIPTION	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Moist. Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Lab. Torvane Shear P.S.F.	PENETRATION DATA: Blows Per Foot (0 10 20 30 40)	2" THIN WALL TUBE SAMPLER BLOWS/0.5'
	ELEV. = 132'± *	0									
	MEDIUM, REDDISH BROWN CLAYEY SILT		9-24-69 ▽	8-A	-	55	-	7970	-		1/.5' 2/.5'
	MEDIUM, REDDISH BROWN W/GRAY, SILTY CLAY	5		8-B	-	80	-	1500	-		1/.5' 3/.5'
		10		8-C	-	75	-	1560	-		2/.5' 3/.5'
					-	59	-	1930	-		
(MH)	MEDIUM, TAN-BROWN, CLAYEY SILT	15		8-D	-	68	-	1510	450		2/.5' 4/.5'
		20		8-E	-	73	-	-	-		3/.5' 5/.5'
	ROCK OR BOULDER			8-F		(ROCK FRAGMENT)					48/.2'
	END OF BORING @ 23.2'										

*ELEVATION ESTIMATED FROM GRADING PLAN

M's 9/69

CATHOLIC CHURCH SITE - AHUIMANU

TABLE I A - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	1	1	1	3A	3A
SAMPLE NO.		E	G	A	B
DEPTH BELOW SURFACE	SURFACE	20'-21.5'	30'-31.5	3'-5'	
DESCRIPTION	BROWN CLAYEY SILT W/SAND & DECOMP. ROCK	MOTTLED BROWN CLAY	MOTTLED GRAY CLAY W/TRACES OF DECOMP. ROCK	BROWN & GRAY SILTY CLAY	BROWN & GRAY SILTY CLAY
GRADING ANALYSIS (% Passing) Sieve					
1"	100				
½"	100				
#4	99.0				
#10	95.4				
#20	86.5				
#40	77.0				
#100	62.2				
#200	53.6				
ATTERBERG LIMITS					
Air Dried or Natural	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL
Liquid Limit	66	154	148	131	100
Plastic Limit	46	49	52	53	51
Plasticity Index	20	105	96	78	49
Dilatancy	SLOW	SLOW	VERY SLOW	QUICK	SLOW
Toughness	SLIGHT	MEDIUM	MEDIUM	SLIGHT-MED	MEDIUM
Dry Strength	SLIGHT	MEDIUM	MEDIUM	SLIGHT-MED	SLIGHT-MED
UNIFIED SOIL CLASSIFICATION	MH	CH	CH	MH	MH
SPECIFIC GRAVITY					
EXPANSION AND CBR TESTS (Surcharge-51 P.S.F.)					
Molding Moisture Content, %	33.4				
Molding Dry Density, P.C.F.	88.5				
Swell upon saturation, %	0.7				
CBR at 0.1" Penetration	36.0				
COMPACTION TEST (AASHO T-180-57 Method ___)					
Dry to Wet or Wet to Dry					
Max. Dry Density (P.C.F.)					
Optimum Moisture (%)					

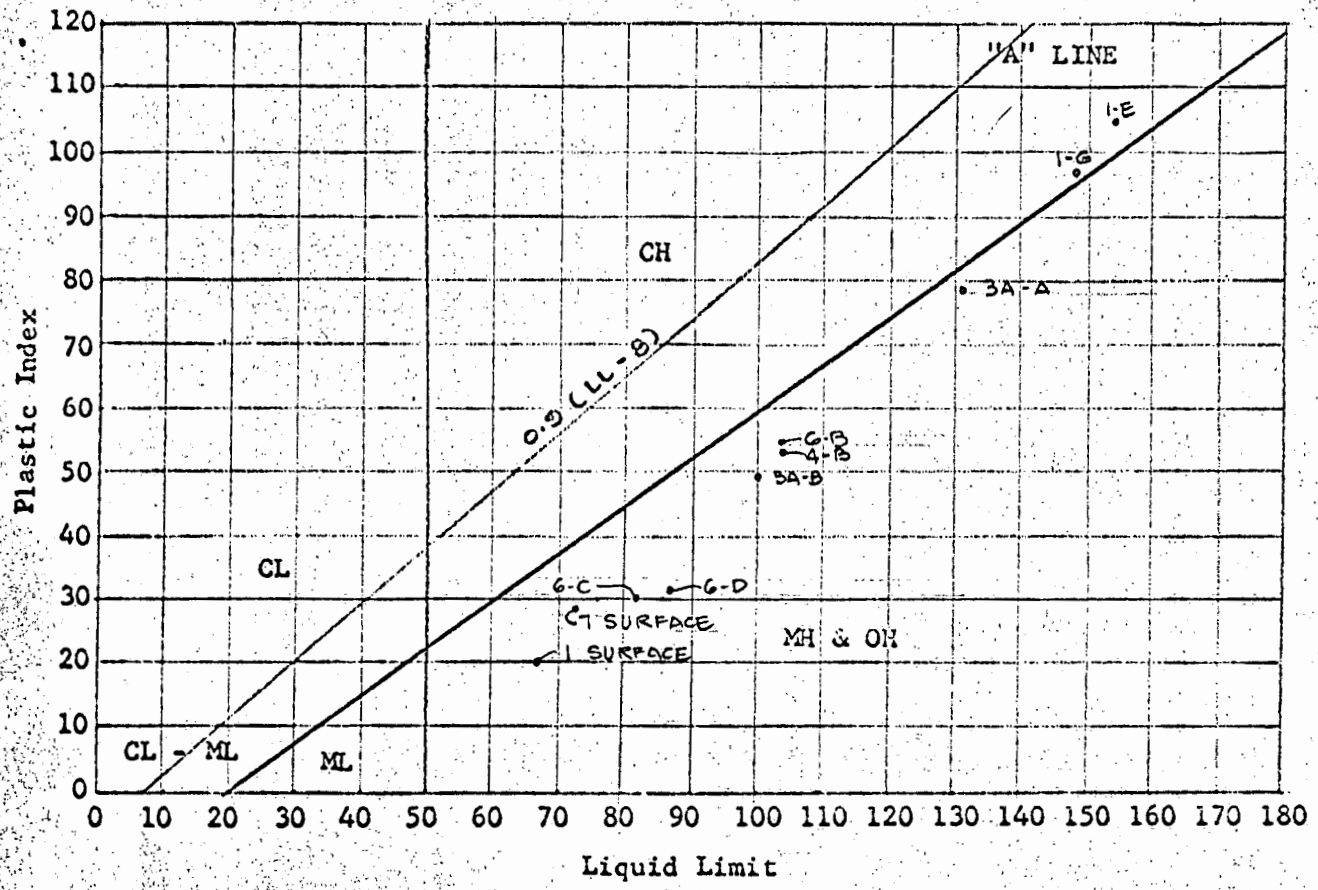
CATHOLIC CHURCH SITE - AHUIMANU

TABLE I B - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	4	6	6	6	7
SAMPLE NO.	B	B	C	D	
DEPTH BELOW SURFACE	5'-6'	5'-6.5'	10'-11.5'	20'-21.5'	SURFACE
DESCRIPTION	BROWN CLAYEY SILT W/SOME DECOMP. ROCK	MOTTLED BROWN CLAY W/TRACES OF DECOMP. ROCK	MOTTLED GRAY-BROWN CLAYEY SILT W/DECOMP. ROCK	MOTTLED GRAY-BROWN CLAYEY SILT W/DECOMP. ROCK	BROWN CLAYEY SILT W/TRACES OF DECOMP. ROCK
GRADING ANALYSIS (% Passing) Sieve					
1"					100
½"					100
#4					99.2
#10					99.0
#20					98.9
#40					98.6
#100					97.9
#200					97.7
ATTERBERG LIMITS					
Air Dried or Natural	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL
Liquid Limit	104	104	82	86	73
Plastic Limit	50	49	52	55	45
Plasticity Index	54	55	30	31	28
Dilatancy	SLOW	SLOW	QUICK-MED.	QUICK-MED	SLOW
Toughness	MEDIUM	MEDIUM	SLIGHT-MED.	SLIGHT-MED.	MEDIUM
Dry Strength	MEDIUM	SLIGHT-MED	SLIGHT-MED.	SLIGHT-MED.	SLIGHT-MED.
UNIFIED SOIL CLASSIFICATION	MH	MH	MH	MH	MH
SPECIFIC GRAVITY					
EXPANSION AND CBR TESTS (Surcharge-51 P.S.F.)					
Molding Moisture Content, %					
Molding Dry Density, P.C.F.					
Swell upon saturation, %					
CBR at 0.1" Penetration					
COMPACTION TEST (AASHO T-180-57 Method___)					
Dry to Wet or Wet to Dry					
Max. Dry Density (P.C.F.)					
Optimum Moisture (%)					

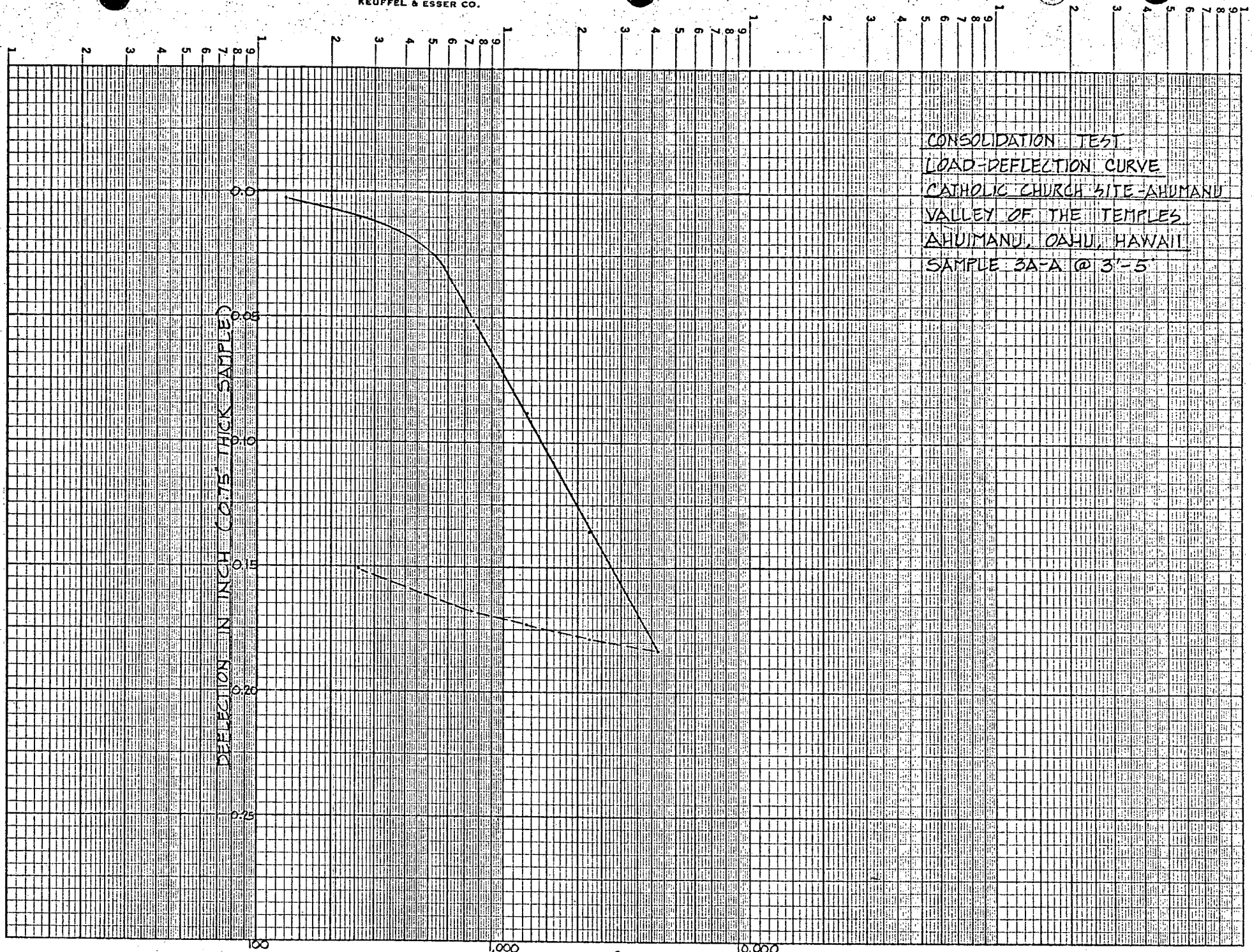
JOB: CATHOLIC CHURCH SITE - AHUIMANU
VALLEY OF THE TEMPLES

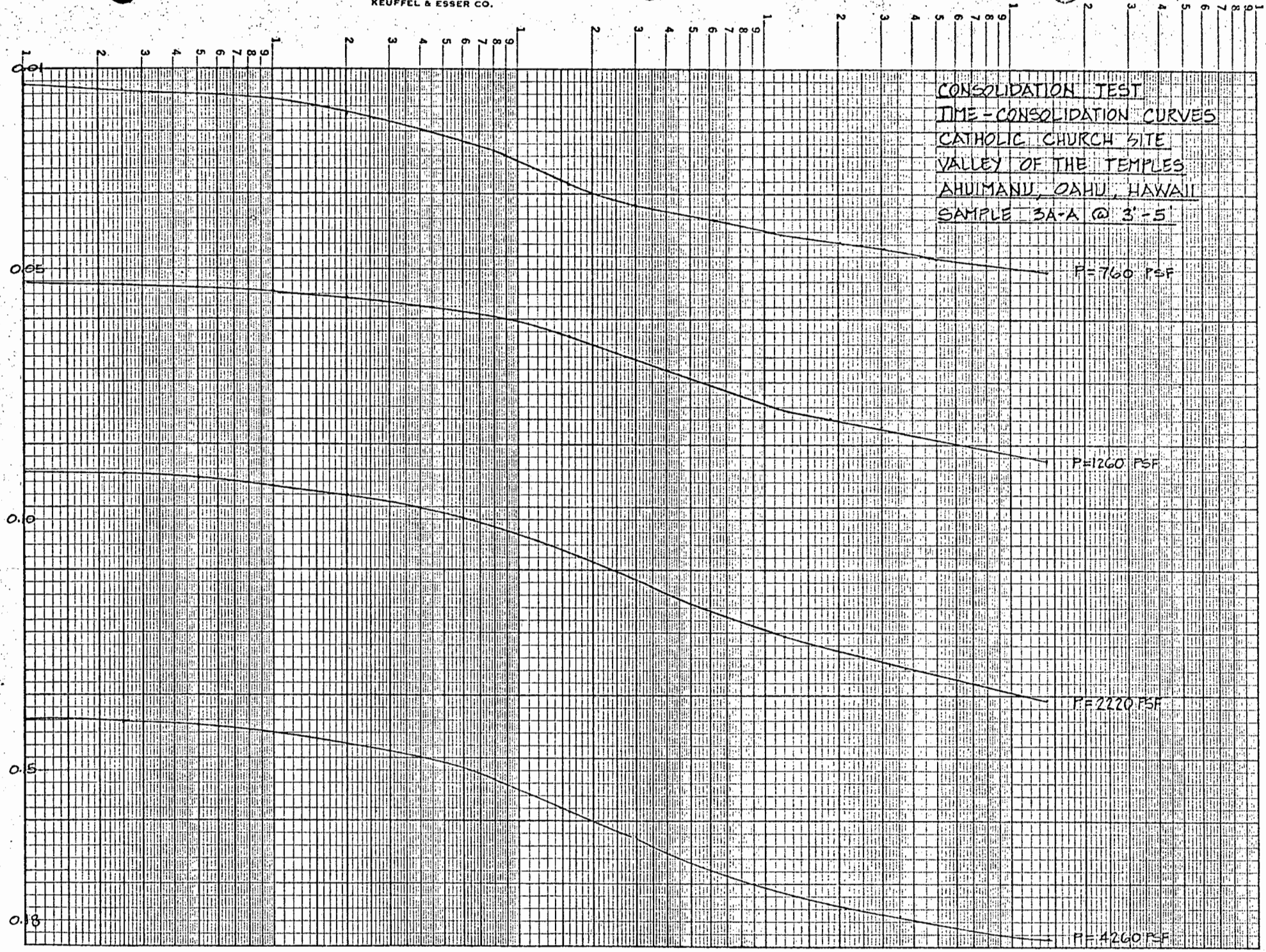
LOCATION: AHUIMANU, OAHU, HAWAII



PLASTICITY CHART

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS





LIMITATIONS

In general, soil formations are commonly erratic and rarely uniform or regular. The borings indicate the subsurface soil conditions encountered only at the drill holes where the borings were made. During construction, should subsurface conditions much different from those in the borings be observed, encountered, or otherwise indicated, we should be advised immediately to review or reconsider our recommendations in light of the new developments. The owner, architect, or engineer should make certain that the recommendations are incorporated into the plans and are properly carried out during construction.

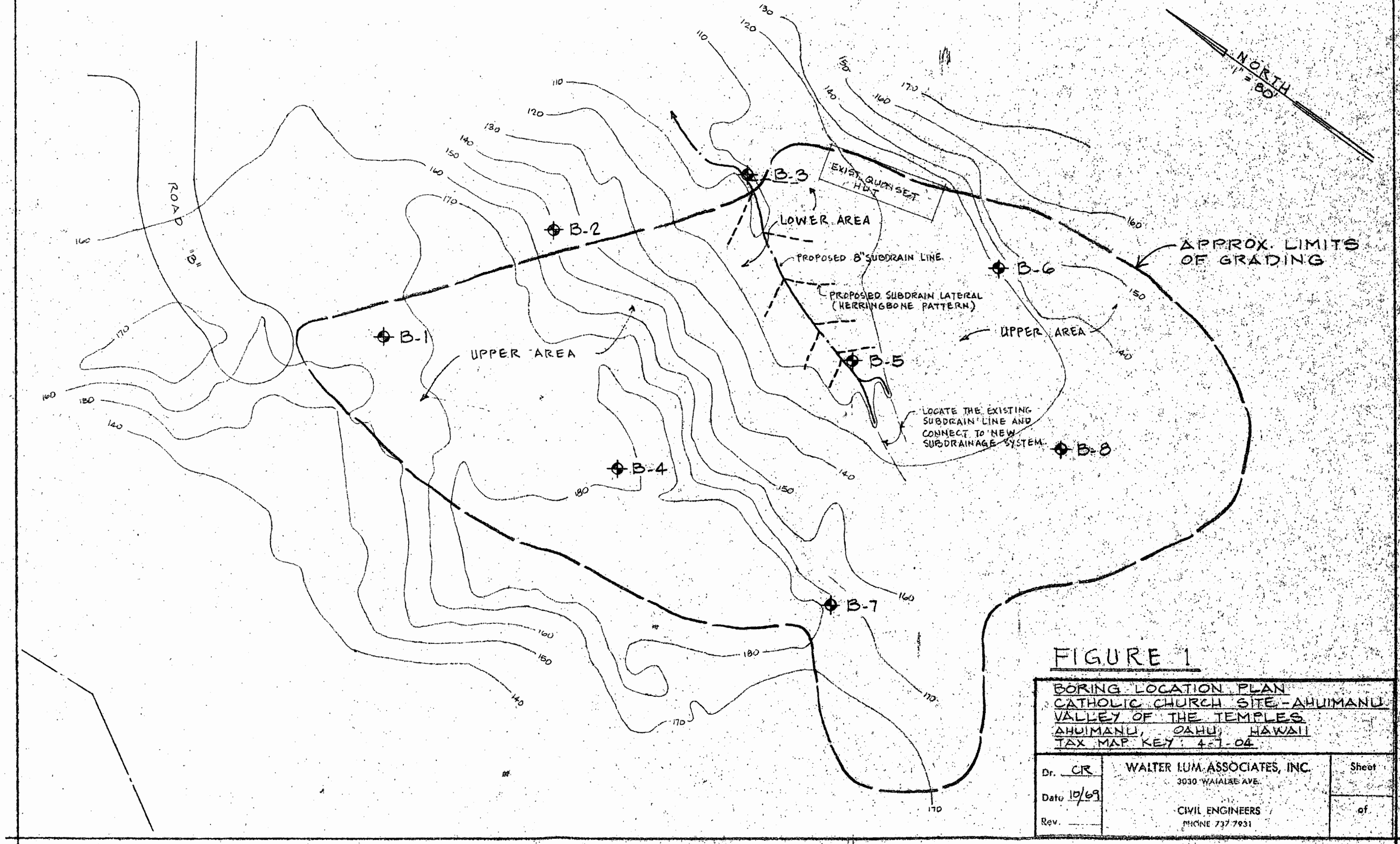
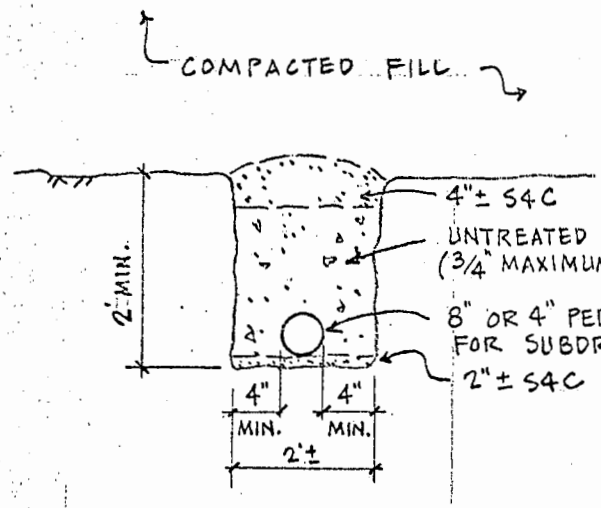


FIGURE 1

BORING LOCATION PLAN
CATHOLIC CHURCH SITE - AHUIMANU
VALLEY OF THE TEMPLES
AHUIMANU, OAHU, HAWAII
TAX MAP KEY: 4-7-04

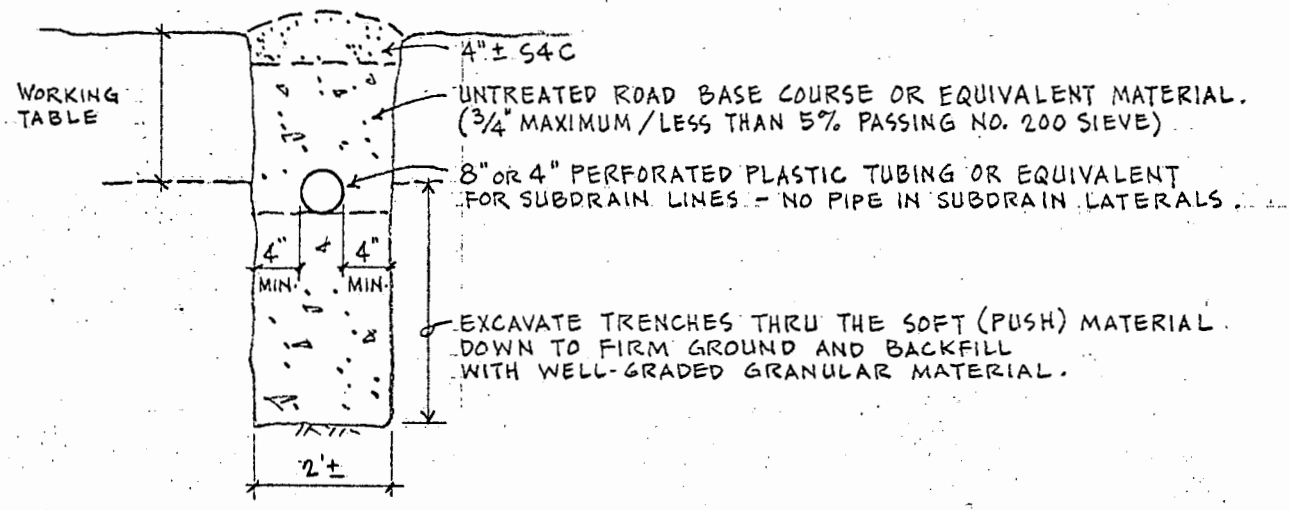
Dr. CR Date 10/69 Rev.	WALTER LUM ASSOCIATES, INC. 3030 WAIALAE AVE. CIVIL ENGINEERS PHONE 737-7931	Sheet of



SUBDRAIN LINE (WITH PERFORATED PIPE)

SUBDRAIN LATERAL (WITHOUT PERFORATED PIPE)

NOT TO SCALE



SUBDRAIN LINE THRU MARSHY AREA

NOT TO SCALE

FIGURE 2

PROPOSED SUBDRAINS

CATHOLIC CHURCH SITE - AHUIMANU

VALLEY OF THE TEMPLES

AHUIMANU , OAHU , HAWAII

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